CLAIMS

What is claimed is:

1. An iontophoretic fluid delivery device comprising:

a cationic chamber defining a volume n which to hold a cationic substance, a wall of said chamber having a first passageway permitting migration therethrough by ions

an anionic chamber defining a volume in which to hold an anionic substance, a wall of said anionic chamber having a second passageway permitting migration therethrough by ions, said first and second passageways being oriented and arranged on a surface of a container to enable creation of an ion conducting path, through a cooperating body, of an electrical circuit between said cationic and anionic chambers

a first electromotive cell, constructed to produce an approximately square-wave current discharge over its working life and comprising first and second poles of opposite electrical sign, said first cell being disposed in an electron conducting path configured to complete said electrical circuit

2. The iontophoretic fluid device of claim 1, further comprising:

a fluid resistant barrier operable n said first electromotive cell to isolate an electrolytic path between said first and second poles and configured to expose said first pole to an electrolyte, said first pole being located and arranged to contact an electrolyte contained in one of said cationic and anionic chambers; and

an electrically conductive lead in electrical contact with said second pole to form a portion of said electron conducting path.

3. The iontophoretic fluid device of claim 1, further comprising:

a second electromotive cell, constructed to produce an approximately square-wave current discharge over its working life and comprising third and fourth poles of opposite electrical sign, the sign of said third pole corresponding to the sign of said first pole said second cell being disposed in-circuit in said electron conducting path; and

a fluid resistant barrier operable on said second cell to isolate an electrolytic path between said third and fourth poles, and configured to expose said fourth pole to an electrolyte, said second cell being located and arranged for said fourth pole to contact an electrolyte contained in the other of said cationic and anionic chambers

4. The iontophoretic fluid device of claim 3, wherein:

said first cell is disposed at least partially within said cationic chamber;

said second cell is disposed at least partially within said anionic chamber;

said first pole has an electrically negative sign; and

said fourth pole has an electrically positive sign.

5. The iontophoretic fluid device of claim 4, further comprising:

an oscillator element disposed in-circuit in said electron conducting path and operable to control a current flow between high and low values.

6. The iontophoretic fluid device of claim 1, said first cell comprising a mini battery constructed to operate with a metal-anode based electro-chemical reaction, wherein said metal is selected from the group consisting of lithium, zinc, magnesium, and aluminum.

7. The iontophoretic fluid device of claim 3, said second cell comprising a mini battery constructed to operate with a metal-anode based electro-chemical reaction, wherein said metal is selected from the group consisting of lithium, zinc, magnesium, and aluminum.

8. The iontophoretic fluid device of claim 2, wherein said first cell comprises a mini battery having the exposed portion of said first pole formed from a noble conductive material.

9. The iontophoretic fluid device of claim 3, wherein said second cell comprises a mini battery having the exposed portion of said fourth pole formed from a noble conductive material.

10. The iontophoretic fluid device of claim 1, wherein said container comprises an adhesive patch.

11. An iontophoretic fluid delivery device, comprising:

a cationic chamber defining a volume and being configured to permit migration of ions along a first path of an electrical circuit;

an anionic chamber spaced apart from said cationic chamber by structure of a container, said anionic chamber defining a volume and being configured to permit migration of ions along said first path, said first path further comprising a cooperating body disposable between said cationic and anionic chambers;

a first electromotive cell comprising an electrically positive pole and an electrically negative pole;

a fluid resistant barrier operable to isolate an electrolytic path between said positive and negative poles and configured to expose said negative pole for electron transfer with an electrolyte; and

a portion of said first cell, comprising said negative pole, being disposed within said cationic chamber, said first cell being located in-circuit in a second path configured to complete said electrical circuit.

16. The iontophoretic fluid device of claim 11, wherein said container comprises an adhesive patch.

17. The iontophoretic fluid device of claim 11, wherein said container comprises a cartridge.

18. The iontophoretic fluid device of claim 11, wherein said first cell is constructed to produce an approximately square-wave current discharge over its working life.

19. The iontophoretic fluid device of claim 18, wherein said first cell is constructed containing electro-chemically reactive matter in an amount operable to control a length in time of said working life.

20. The iontophoretic fluid device of claim 11, further comprising a switch in said second leg of said electrical circuit.

21. An iontophoretic fluid delivery device, comprising:

a cationic chamber defining a volume, a wall of said chamber having a first passageway permitting migration therethrough by ions;

an anionic chamber defining a volume, a wall of said anionic chamber having a second passageway permitting migration therethrough by ions, said first and second passageways being spaced apart, oriented, and arranged by a surface of a container whereby to enable creation of a first conductive path, through a cooperating body, of an electrical circuit between said cationic and anionic chambers;

a hydrogel substance operable as an electrolyte and disposed in one of said cationic and anionic chambers; and

a first electromotive cell comprising a self-contained mini battery having first and second poles of opposite electrical sign, said first cell being disposed in a second electrically conductive path configured to complete said electrical circuit.

22. The iontophoretic fluid device of claim 21, wherein said first cell is constructed to produce an approximately square-wave current discharge over its working life.

23. The iontophoretic fluid device of claim 21 constructed to operate as a cationic delivery device, wherein said hydrogel is disposed in said anionic chamber and treatment is dispensed to said body from said cationic chamber.

24. The iontophoretic fluid device of claim 21 constructed to operate as an anionic delivery device, wherein said hydrogel is disposed in said cationic chamber and treatment is dispensed to said body from said anionic chamber.

25. The iontophoretic fluid device of claim 21, further comprising:
an electrically conductive substance arranged for substantially uniform distribution of electrons in said chambers whereby to resist onset of polarization and a reduced efficacy of treatment by said device.

26. The iontophoretic fluid device of claim 25, said conductive substance comprising an electrically conductive substrate affixed to a wall of one of said chambers, said substrate having a surface area, for electron transfer, having a size substantially in correspondence with an opening of a said passageway in the chamber in which said substrate is disposed.

27. The iontophoretic fluid device of claim 25, said conductive substance comprising an electrically conductive gauze disposed substantially throughout a volume of one of said chambers.

28. The iontophoretic fluid device of claim 21, said cationic and anionic chambers being constructed to have visibly discernable and different sizes whereby to facilitate placement of medicant in a correct chamber.

29. The iontophoretic fluid device of claim 21, wherein said cationic and anionic chambers are constructed to have visibly discernable and different shapes to facilitate placement of a beneficial fluid in a correct chamber.

30. A method for iontophoretic treatment of a subject, said method comprising:

a) providing an iontophoretic fluid delivery device having a cationic chamber and an anionic chamber, one of said chambers containing a hydrogel;

b) adding a beneficial fluid only to one of said chambers thus forming an electrolyte treatment; and

c) affixing said device to a surface of a subject's body for a duration of time as required to transfer a desired quantity of said treatment to said subject.

12. An iontophoretic fluid delivery device comprising:

a cationic chamber defining a volume and configured to permit migration of ions along a first path of an electrical circuit;

an anionic chamber spaced apart from said cationic chamber by structure of a container, said anionic chamber defining a volume and configured to permit migration of ions along said first path, said first path further comprising a cooperating body disposable between said cationic and anionic chambers; and

a first electromotive cell comprising an electrically positive pole and an electrically negative pole;

a fluid resistant barrier operable to isolate an electrolytic path between said positive and negative poles and configured to expose said positive pole for electron transfer with an electrolyte; with a portion of said first cell, comprising said positive pole, being disposed within said anionic chamber, said first cell being located in-circuit in a second path configured to complete said electrical circuit.

13. The iontophoretic fluid device of claim 11, further comprising:

a second electromotive cell comprising an electrically positive pole and an electrically negative pole;

a fluid resistant barrier operable to isolate an electrolytic path between said positive and negative poles and configured to expose said positive pole for electron transfer with an electrolyte; and

a portion of said second cell, comprising said positive pole, being disposed within said anionic chamber and said second cell being located in-circuit in said second path.

14. The iontophoretic fluid device of claim 11, wherein said first cell comprises a plurality of mini batteries arranged in series to produce an increased cell voltage over a single said mini battery.

15. The iontophoretic fluid device of claim 11, wherein said first cell comprises a mini battery having a rugged housing constructed to resist damage from incidental contact of said container with a blunt object, whereby to prevent leakage of chemical contents from said mini battery.

31. A method for iontophoretically treating a subject, said method comprising:

a) providing an implantable iontophoretic fluid delivery device having a cationic chamber and an anionic chamber, said chambers each having a passageway sealed by a semipermiable membrane permitting ion transport; and

b) implanting said device in a subject's body for a duration of time as required to transfer a desired quantity of said treatment to said subject.

32. In a disposable iontophoretic device having a cationic chamber and an anionic chamber, the improvement comprising placing a self-contained electromotive source in electric circuit between said cationic and said anionic chambers.

33. The disposable iontophoretic fluid device of claim 32, further comprising a shunt resistance disposed in parallel with an ion conducting path between said cationinc and anionic chambers.

34. The disposable iontophoretic fluid device of claim 33, a value of said resistance being selected to determine a quantity of energy from said source for direction through said ion conducting path for delivery of a beneficial agent.

35. The disposable iontophoretic fluid device of claim 34, wherein said resistance has a value between about 1 Ohm and about 10,000 Ohms.

36. The disposable iontophoretic fluid device of claim 32, wherein said electromotive source comprises a mini battery.